IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA,)
)
Plaintiff,)
)
v.) Case No. 05-cv-329-GKF(PJC)
)
TYSON FOODS, INC., et al.,)
)
Defendants.	.)

STATE OF OKLAHOMA'S MOTION IN LIMINE TO PRECLUDE EXPERT TESTIMONY OF DEFENDANTS' WITNESS BILLY CLAY, Ph.D AND INTEGRATED BRIEF IN SUPPORT THEREOF

Plaintiff, the State of Oklahoma ("the State"), pursuant to Fed. R. Evid. 104 and 702, and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), respectfully moves this Court for an order in limine precluding the expert testimony of Defendants' witness Billy Clay, Ph.D ("Dr. Clay") for the reasons set forth below.

I. Introductory Statement

Dr. Clay, a doctor of veterinary medicine, offers opinions outside of his stated education and experience and relies in his report exclusively on an unidentified, unqualified agricultural economist to perform the calculations relating to poultry populations and waste production that are the basis for his opinions. In addition, Dr. Clay applied inconsistent methodologies, ignored available, reliable sources of data, and created novel approaches for calculations contrary to accepted scientific authority. Dr. Clay's methodologies have not been tested or subjected to peer review publication and have not received general acceptance in the relevant scientific community. Furthermore, Dr. Clay's testimony is based on inaccurate data and will not assist the jury in resolving a factual dispute.

II. Factual Background

In November of 2008, Dr. Clay submitted his twenty-two page report in this case. His report sets forth a wide variety of purported expert opinions, which are summarized on pages four and five of his report. *See* Ex. 1, pp. 4-5. His opinions address varied topics, including the volume of poultry and cattle production in the IRW, land application of animal manure in the IRW, amounts of animal waste in the IRW, and bacteria in manure. The key underpinnings of his opinions are the numbers of poultry and cattle in the IRW and the waste they produce.

Dr. Clay is a veterinarian whose work has focused on the development of pharmaceutical products for animals. Dr. Clay stated in his deposition that he is not an agricultural engineer or an agricultural economist. *See* Ex. 2, p. 374:10-13. Dr. Clay has not published materials on the topics he opines about in this case. Instead, his writing experience is limited to numerous proprietary articles and reports authored for pharmaceutical companies. *See* Ex. 2 at 3:24-25:09; 58:22-59:10; 27:9-11; Ex. 1, p. 39.

Dr. Clay's Lack of Expertise

Dr. Clay's proffered opinions are beyond the limits of his training and experience. For example, for his opinions regarding animal populations in the IRW, Dr. Clay relied exclusively on an agricultural economist (who was not identified in his report) to perform critical calculations and retrieve data pertinent to his opinions. When asked during his deposition for reliable scientific authorities to support his opinions that were based on Dr. Jobes' work, Dr. Clay was unable to provide them and could only refer generally to the work performed by Dr. Jobes. *See* Ex. 2 pp. 83:21-84:7; 87:9-13; 87:23-88:4; 119:4-9; 123:10-15; 248:24-249:6; 251:11-14; 268:7-17; 296:22-297:2; 298:22-299:2; 313:21-314:1; 320:12-16; 327:11-18; 328:2-14; 329:16-330:4; 330:25-331:3; 346:14-17; 350:1-4; 351:9-10; 354:10-21; 371:25-374:17;

394:7-23. In fact, Dr. Clay admitted that the scientific "authority" for some of his work was simply "Dr. Jobes" without citation to any peer reviewed, published work. See Ex. 2, p. 319:13-320:2. During his deposition, Dr. Clay was unable to replicate a simple division calculation to arrive at a percentage that was performed by Dr. Jobes. See Ex. 2, p. 392:14-393:19. Dr. Jobes was responsible for much of the work that Dr. Clay relies upon, and he prepared most or all of the appendices to the report. See Ex. 2, p. 315:15-20. However, Dr. Jobes has not been disclosed as a testifying expert in this case and Defendants are attempting to bring his opinions into this case through Dr. Clay who is not qualified to present them.

Another area in which Dr. Clay reaches beyond his expertise is when he opines that the State has not produced evidence that "cattle producers in the IRW have violated the laws and regulations pertaining to the application of poultry litter," while he also admits that he has not thoroughly investigated the truth of that statement. See Ex. 1, p. 5. Summary of Opinions #16; Ex. 2, pp. 423:23-424:9; 429:4-6; 431:24-432:8; 432:15-433:3; 444:19-445:3; 445:17-446:4; 446:17-447:1.

Dr. Clay also stated in his deposition that he does not have qualifications to opine about mass balance studies, yet Dr. Clay expresses criticism regarding the mass balance prepared and reported by Dr. Engel and Meagan Smith. Dr. Clay stated he has never performed a mass balance and has never received specific education or training in its use. See Ex. 1, p. 15; Ex. 2, 386:19-387:4. Dr. Clay also admits he has no knowledge of any of the Defendants' experts having performed a mass balance for any or all of the IRW. See Ex. 2, p. 387:5-8.

Dr. Clay's Unreliable Poultry and Cattle Numbers

Dr. Clay's opinions regarding waste generated in the IRW by poultry and cattle required an estimate of the number of poultry and cattle in the IRW. See Ex. 2, pp. 118:4-119:9; 126:717. Dr. Clay used inconsistent methodology to arrive at the numbers that purport to support his opinions. Dr. Clay (through the work of Dr. Jobes) "counted" poultry (broilers & turkeys) in the IRW by using government agricultural census *sales* data but ignored *inventory* data. Then, switching methodologies midstream, he did *just the opposite* for his cattle number calculations. For cattle numbers, Dr. Clay used 2002 Agriculture Census *inventory* data and ignored *sales* data. *See* Ex. 1, Appendix A, Table A-A & Appendix C, Appendix D, Tables DA-1 DA-2 DA-3; Ex. 2, 118:15-25; 119:14-16; 123: 16-22; 124:14-19; 324:6-10; 345:113-19; 347:20-348:7; 394:24-395:8. Dr. Clay admitted in his deposition that cattle might be bought and sold during the year, but he did not use the reliable 2002 Agriculture Census to provide the most accurate data. Instead, he created a formula for which there is no scientifically accepted authority. *See* Ex. 2, 335:3-22; 336:17-337-24. Dr. Clay even acknowledged in his deposition that the Agricultural Census has the data available but that he chose not to use it. *See* Ex. 2, 345:13-:346:2; 346:3-8.

Dr. Clay also ignored the definitions and instructions formulated by the U. S. Agricultural Census data by increasing *by thirty percent* the cattle population animal units, which in turn inflated his cattle number and cattle waste volume calculations. Dr. Clay counted bulls and heifers more than once to change his animal unit for cattle from 1 to 1.3, while admitting those animals are already accounted for in the census data. *See* Ex. 2, 333:14-337:24. Dr. Clay essentially manufactured data for cattle numbers while ignoring scientifically acceptable census data that was available. This caused him to increase the amount of waste produced by cattle above that which is cited in the USDA Agricultural Waste Management Handbook (hereinafter "Agricultural Handbook). *See* Ex. 2, p. 82:1-7. Dr. Clay's only authority to support this novel, untested computation was Dr. Jobes, an agricultural economist whose qualifications are

unknown and who will not be testifying in the case. See Ex. 2, 83:21-84:2.

Dr. Clay's methodology for counting poultry relied on zip code data to quantify the number of birds produced in the IRW. See Ex. 2, pp. 124:14-19; 327:6-10. Dr. Clay testified that he knew that the zip code data does not report all farms within a zip code due to confidentiality requirements of the census. See Ex. 2, pp. 328:20-23; Ex. 1, Appendix B, Tables BA & BO. Dr. Clay admitted in his deposition that using this methodology to determine the number of birds produced in the IRW resulted in significant inaccuracy -- for example, of undercounting broilers by over 6 million and turkeys by 2.2 million in a single zip code area. See Ex. 2, 332:14-333:5; 338:6-340:17; Ex 5, Clay Deposition Exhibit #50. Dr. Clay, aware that he was under reporting the amount of birds nonetheless did not even contact Defendants for accurate bird count data. See Ex. 2, pp. 330:25-331:7. Simply put, Dr. Clay's methodology was dependent on the total number of birds, yet he failed to use a reliable method for determining the correct numbers. See Ex. 2, pp. 361:24-362:2

Dr. Clay also admitted in his deposition that he erroneously used 2002 annual data for his poultry waste calculations, but purposely reduced that total by other data from 2007. *See* Ex. 2, pp. 288:16-289:8. Additionally Dr. Clay used an average weight for broilers that was less than that reported by Defendants in documents produced in this case and by several growers in their depositions, all of whom reported average bird weights in excess of the amount used by Dr. Clay. Finally, Dr. Clay made no inquiry of Defendants to validate actual average bird weights for such calculations. *See* Ex. 2, 320:7-10; 326:9-19. In addition, Dr. Clay rounded down the average number of broiler flocks grown per year which lowered the poultry waste contribution. *See* Ex. 2, pp. 348:25-349:10.

Dr. Clay's Unreliable Bases for Waste Calculations

Dr. Clay ignores reliable data available to him in recognized, authoritative materials regarding poultry manure and waste characteristics, and instead performs a complicated calculation to further "dry" the poultry waste, thus reducing its weight and the amount of poultry waste contribution to the IRW. See Ex. 2, 371:19-372:2; Ex. 1 at Appendix A Table A-A. Notably, Dr. Clay did not actually perform the "drying" calculation himself, but rather Dr. Jobes does this calculation without reference to any scientific data or authority. See Ex. 2, 371:19-373:13. Dr. Clay did nothing to verify what, if any, authority Dr. Jobes may have relied on to construct his calculation, thus eliminating the ability to validate or test this undocumented methodology. See Ex. 2, 372:22-373:13. In describing the drying process, Dr. Clay uses the term "fermentation" which implies it is a recognized process. See e.g. Ex. 1, p. 13. However, Dr. Clay stated in his deposition that he did nothing to establish that "fermentation" occurs in the poultry barn. When asked whether "fermentation" is a term identified in any studies in his considered materials or in the Agricultural Handbook he says "no." See Ex. 2, 260:7-15; 263:2-5; 270:23-271:3; 354:3-21. Dr. Clay agreed this "fermenting" or drying process that he attempted to calculate is already accounted for in the reliable data available in the Agricultural Handbook. However, rather than using the data available from the Agricultural Handbook, Dr. Clay chose to use his own, untested, unreliable "fermentation" methodology to address the manner in which poultry waste dries. See Ex. 2, pp. 355:18-356:9, 359. Dr. Clay admits he created the drving or "fermentation" calculation, that the calculation is not the same as that reported in the Agricultural Handbook, and that it results in a lower number than the Agricultural Handbook data. See Ex. 2, 356:22-25; 357:1-14; 358:7-15; 358:22-359:6.

In addition, Dr. Clay stated, both in deposition and at the Preliminary Injunction hearing,

that comparing waste of poultry and beef cattle must be done on either a "dry versus dry" or "wet versus wet" basis. *See* Ex. 2, 378:3-12. However, in his report, Dr. Clay ignores this principle, failing to use comparable values for the amount of cattle waste produced in the IRW and to decrease the amount of poultry waste produced in the IRW. *See* Ex. 2, pp. 358:7-15; 359:9-13; Ex. 1, p. 13, p. 17, Appendix A, Table A-A; Appendix G.

III. Legal Standard

Federal Rule of Evidence 702 provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Thus, "Fed. R. Evid. 702 imposes on the trial judge an important 'gate-keeping' function with regard to the admissibility of expert opinions." *Ralston v. Smith & Nephew Richards, Inc.*, 275 F.3d 965, 969 (10th Cir. 2001). As an initial matter, the court must determine the expert is qualified by "knowledge, skill, experience, training, or education" to render an opinion. *Id.* "It should be borne in mind that the issue with regard to expert testimony is not the qualifications of a witness in the abstract, but whether those qualifications provide a foundation for a witness to answer a specific question." *In re Williams Securities Litigation*, 496 F. Supp. 2d 1195, 1232 (N.D. Okla. 2007)(internal quotations omitted). An expert's qualifications must be both adequate in a general, qualitative sense and specific to the matters he proposes to address as an expert. *See id.*

As explained in *In re Williams Securities Litigation*,, 496 F. Supp. 2d at 1195: [I]t should be borne in mind that "[t]he issue with regard to expert testimony is

not the qualifications of a witness in the abstract, but whether those qualifications provide a foundation for a witness to answer a specific question." Berry v. City of Detroit, 25 F.3d 1342, 1351 (6th Cir. 1994), cert. denied, 513 U.S. 1111, 115 S. Ct. 902, 130 L. Ed. 2d 786 (1995). See also, Wheeling Pittsburgh Steel Corp. v. Beelman River Terminals, Inc., 254 F.3d 706, 715 (8th Cir. 2001) ("To begin with, we agree with the district court that Dr. Curtis . . . easily qualifies as an expert under Federal Rule of Evidence 702. The real question is, what is he an expert about?") and Westfed Holdings, Inc. v. United States, 55 Fed. Cl. 544, 571 (2003), rev'd in part on other grounds, 407 F.3d 1352 (Fed. Cir. 2005). Thus, on the issue of expert qualifications, Ralston and like cases establish that the qualifications of the proposed expert are to be assessed only after the specific matters he proposes to address have been identified. The controlling Tenth Circuit cases, exemplified by Ralston, establish that the expert's qualifications must be both (i) adequate in a general, qualitative sense (i.e., "knowledge, skill, experience, training or education" as required by Rule 702) and (ii) specific to the matters he proposes to address as an expert.

Next, the court must ensure that the scientific testimony being offered is "not only relevant, but reliable." *See Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 589 (1993).\(^1\) "To be reliable under *Daubert*, an expert's scientific testimony must be based on scientific knowledge" *Dodge v. Cotter Corp.*, 328 F.3d 1212, 1222 (10th Cir. 2003). The Supreme Court has explained that the term "scientific" "implies a grounding in the methods and procedures of science." *Daubert*, 509 U.S. at 590. Likewise, it has explained that the term "knowledge" "connotes more than subjective belief or unsupported speculation." *Id.* Thus, "in order to qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation -- *i.e.*, 'good grounds,' based on what is known." *Id.*

The Supreme Court has set forth four non-exclusive factors that a court may consider in making its reliability determination: (1) whether the theory or technique can be (and has been)

The Supreme Court held in *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), that the gatekeeping function set out in *Daubert* applies not only to expert testimony based on scientific knowledge, but also expert testimony based upon technical or other specialized knowledge -- *i.e.*, it applies to all expert testimony.

they generate." *Daubert*, 509 U.S. at 595.

tested, *id.* at 593; (2) whether the theory or technique has been subjected to peer review and publication, *id.*; (3) the known or potential rate of error and the existence and maintenance of standards controlling the technique's operation, *id.* at 594; and (4) whether the theory or technique has general acceptance in the scientific community, *id.* The inquiry is "a flexible one." *Id.*; *see also id.* at 593 ("[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test"); *Dodge*, 328 F.3d at 1222 ("the list is not exclusive"). "The focus [of the inquiry]... must be solely on principles and methodologies, not on the conclusions that

To be relevant, the testimony must "assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702. This consideration has been described as one of "fit." *See Daubert*, 509 U.S. at 591. "'Fit' is not always obvious, and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes." *Id*.

In sum, "[t]he objective of [the gatekeeping] requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152.

Finally, the party proffering the expert scientific testimony bears the burden of establishing admissibility under the Federal Rules of Evidence and *Daubert*. *See Ralston*, 275 F.3d at 970 fn. 4.

IV. Argument

A. Dr. Clay Lacks the Expertise Needed to Opine on the Matters in his Report
Dr. Clay's report relies upon calculations of the numbers of poultry and cattle in the

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watershed, and upon waste calculations derived from the population numbers. In addition to the fact that the methods used to calculate those numbers are unreliable, as demonstrated infra, Dr. Clay does not have the necessary specific qualifications to opine on these matters. As explained supra, Dr. Clay had to rely upon an agricultural economist to collect the data and perform the calculations and analysis that form the basis for his opinions. Perhaps Defendants should have disclosed that agricultural economist, Dr. Jobes, as their testifying expert in this case, but they did not. Instead, Defendants are attempting to offer a veterinarian, whose work has focused on pharmaceutical developments, to opine on matters well beyond his expertise. As demonstrated by the materials considered by Dr. Clay, the authors of recognized published literature in the scientific community on animal waste characteristics are agricultural engineers, not veterinarians. See e.g. Ex. 3, Agricultural Waste Management Field Handbook, Chapter 4. US Department of Agriculture Soil Conservation Service. 210-AWMFH, 4/92 (Clay000135); Ex. 4, American Society of Agricultural and Biological Engineers Standards for Manure Production and Characteristics (Clay000716). Because Dr. Clay lacks the expertise to opine on these matters, and these matters are the underlying basis for all of his opinions, Dr. Clay's opinions should be excluded in their entirety. In addition, Dr. Clay's opinions critiquing mass balance studies, as well as whether cattle producers have violated the law, are clearly beyond his areas of expertise and experience, as he admitted in his deposition. Thus, these opinions must also be excluded. See supra, p. 3.

B. The Cattle and Poultry Numbers Relied Upon by Dr. Clay are Unreliable, Thereby Rendering Opinions Based Upon these Numbers Unreliable

Even if the Court were to determine that Dr. Clay was somehow qualified to opine on the matters in his report, his opinions regarding the numbers of cattle and poultry in the IRW, and

the amounts of waste these animals generate are unreliable. Dr. Clay's inconsistent approach for counting poultry and cattle, which mixed inventory and sales numbers, ignored scientifically consistent data and demonstrates a bias in his analysis. See supra, pp. 4-5. Dr. Clay admitted in his deposition that he did not use data from the census on cattle sold even though it exists. See Ex. 2, 345:113-19. Dr. Clay also admitted that there were gross underestimates in his (or Dr. Jobes') poultry calculations. See e.g. Ex. 2 pp. 330-333 (Dr. Clay admitting that his count of turkeys underestimated the accurate number 2.8 million by 2.2 million, using the inaccurate and unreliable count of 669,000 instead). As discussed above, Dr. Clay also underestimated the average weight of birds, which caused him to again underestimate the amount of waste being generated. The biased analysis employed by Dr. Clay caused him to inaccurately and unreliably increase the amount of waste generated by cattle and decrease the amount of waste generated by poultry. In short, Dr. Clay knowingly used methodologies that would not capture the accurate data. To make matters worse, Dr. Clay did nothing to remedy his unreliable data, despite the fact he could have obtained better data from Defendants, who retained him to opine on these issues. This flawed methodology intentionally resulted in a minimized, inaccurate and unreliable estimate of the amount of poultry waste generated in the IRW. In addition, nothing was done to calculate any margin of error in the estimates made. See Ex. 2, 329:25-330:4. Thus, because his methodologies used inaccurate data, and were performed in an unreliable manner, Dr. Clay's opinions must be excluded in their entirety.

C. Dr. Clay's Method to Account for the Drying of Poultry Waste is Is Not Supported by Science and is thus Unreliable

In forming his opinions regarding poultry waste in the IRW, Dr. Clay used a theory he calls "fermentation" to account for the drying of poultry waste. The result of Dr. Clay applying

his "fermentation" calculation is that it lowers the amount of poultry waste in comparison to cattle waste. Dr. Clay's "fermentation" calculation is a methodology that has not been tested or subjected to peer review, and it was performed by an individual who will not be testifying in this case. In addition, the drying of poultry waste is already accounted for in reliable, authoritative materials on this topic, which were available to Dr. Clay. Yet, instead of using that reliable source of information, he applied his novel "fermentation" method to the data, a method that has not been peer-reviewed, tested, or accepted in the field. Thus, it is an unreliable basis for Dr. Clay's opinions and his opinions must be excluded.

V. Conclusion

Dr. Clay ignored well-established, reliable resources, including government data and analyses that were contained in his considered materials, and instead created, through Dr. Jobes, convoluted theories and calculations to fabricate a waste comparison analysis to support his opinions. There was no need for Dr. Clay (and Dr. Jobes) to invent and apply novel theories and methodologies when reliable data on these topics is reported in scientifically accepted publications, such as the Agricultural Handbook, the ASABE standards and the 2002 Agricultural Census. The methodologies and theories employed by Dr. Clay are unsupported by published literature and the norms in the field, and have resulted in his opinions being biased and inaccurate.

WHEREFORE, in light of the foregoing, this Court should enter an order in limine precluding the expert testimony of Defendants' witness Billy Clay in its entirety.

Respectfully Submitted,

W.A. Drew Edmondson OBA # 2628 ATTORNEY GENERAL Kelly H. Burch OBA #17067

J. Trevor Hammons OBA #20234 Daniel P. Lennington OBA #21577 ASSISTANT ATTORNEYS GENERAL State of Oklahoma 313 N.E. 21st St. Oklahoma City, OK 73105 (405) 521-3921

/s/ Richard T. Garren

M. David Riggs OBA #7583 Joseph P. Lennart OBA #5371 Richard T. Garren OBA #3253 Sharon K. Weaver OBA #19010 Robert A. Nance OBA #6581 D. Sharon Gentry OBA #15641 David P. Page OBA #6852 RIGGS, ABNEY, NEAL, TURPEN, **ORBISON & LEWIS** 502 West Sixth Street Tulsa, OK 74119 (918) 587-3161

Louis W. Bullock OBA #1305 Robert M. Blakemore OBA 18656 BULLOCK, BULLOCK & BLAKEMORE 110 West Seventh Street Suite 707 Tulsa OK 74119 (918) 584-2001

Frederick C. Baker (admitted pro hac vice) Lee M. Heath (admitted pro hac vice) Elizabeth C. Ward (admitted pro hac vice) Elizabeth Claire Xidis (admitted *pro hac vice*) MOTLEY RICE, LLC 28 Bridgeside Boulevard Mount Pleasant, SC 29465 (843) 216-9280

William H. Narwold (admitted pro hac vice)

Ingrid L. Moll (admitted pro hac vice) MOTLEY RICE, LLC 20 Church Street, 17th Floor Hartford, CT 06103 (860) 882-1676

Jonathan D. Orent (admitted pro hac vice) Michael G. Rousseau (admitted pro hac vice) Fidelma L. Fitzpatrick (admitted pro hac vice) MOTLEY RICE, LLC 321 South Main Street Providence, RI 02940 (401) 457-7700

Attorneys for the State of Oklahoma

CERTIFICATE OF SERVICE

I hereby certify that on this 18th day of May, 2009, I electronically transmitted the above and foregoing pleading to the Clerk of the Court using the ECF System for filing and a transmittal of a Notice of Electronic Filing to the following ECF registrants:

W. A. Drew Edmondson, Attorney General	fc_docket@oag.state.ok.us
Kelly H. Burch, Assistant Attorney General	kelly_burch@oag.state.ok.us
J. Trevor Hammons, Assistant Attorney General	trevor_hammons@oag.state.ok.us
Daniel P. Lennington, Assistant Attorney General	daniel.lennington@oag.ok.gov
M. David Riggs	driggs@riggsabney.com
Joseph P. Lennart	jlennart@riggsabney.com
Richard T. Garren	rgarren@riggsabney.com
Sharon K. Weaver	sweaver@riggsabney.com
Robert A. Nance	rnance@riggsabney.com
D. Sharon Gentry	sgentry@riggsabney.com
David P. Page	dpage@riggsabney.com
RIGGS, ABNEY, NEAL, TURPEN, ORBISON & LEWIS	
Louis Werner Bullock	lbullock@bullock-blakemore.com
Robert M. Blakemore	bblakemore@bullock-blakemore.com
BULLOCK, BULLOCK & BLAKEMORE	

Frederick C. Baker	fbaker@motleyrice.com
Lee M. Heath	lheath@motleyrice.com
Elizabeth C. Ward	lward@motleyrice.com
Elizabeth Claire Xidis	cxidis@motleyrice.com
William H. Narwold	bnarwold@motleyrice.com
Ingrid L. Moll	imoll@motleyrice.com
Jonathan D. Orent	jorent@motleyrice.com
Michael G. Rousseau	mrousseau@motleyrice.com
Fidelma L. Fitzpatrick	ffitzpatrick@motleyrice.com
MOTLEY RICE, LLC	
Counsel for State of Oklahoma	
Commonweal	
Robert P. Redemann	rredemann@pmrlaw.net
PERRINE, MCGIVERN, REDEMANN, RE	ID, BARRY & TAYLOR, P.L.L.C.
David C. Senger	david@cgmlawok.com
Robert E Sanders	rsanders@youngwilliams.com
Edwin Stephen Williams	steve.williams@youngwilliams.com
YOUNG WILLIAMS P.A.	
Counsel for Cal-Maine Farms, Inc and Ca	l-Maine Foods, Inc.
John H. Tucker	jtucker@rhodesokla.com
Theresa Noble Hill	thill@rhodesokla.com
Colin Hampton Tucker	ctucker@rhodesokla.com
Kerry R. Lewis	klewis@rhodesokla.com
RHODES, HIERONYMUS, JONES, TUCK	ER & GABLE
Terry Wayen West	terry@thewestlawfirm.com
THE WEST LAW FIRM	
Delmar R. Ehrich	dehrich@faegre.com
Bruce Jones	bjones@faegre.com
Krisann C. Kleibacker Lee	kklee@faegre.com
Todd P. Walker	twalker@faegre.com
Christopher H. Dolan	cdolan@faegre.com
Melissa C. Collins	mcollins@faegre.com
Colin C. Deihl	cdeihl@faegre.com
Randall E. Kahnke	rkahnke@faegre.com
FAEGRE & BENSON, LLP	
FAEGRE & BENSON, LLP	

Mark D. Hopson

Jay Thomas Jorgensen

mhopson@sidley.com

jjorgensen@sidley.com

Timothy K. Webster	twebster@sidley.com
Thomas C. Green	tcgreen@sidley.com
Gordon D. Todd	gtodd@sidley.com
SIDLEY, AUSTIN, BROWN & WOOD LLP	
Robert W. George	robert.george@tyson.com
L. Bryan Burns	bryan.burns@tyson.com
Timothy T. Jones	tim.jones@tyson.com
TYSON FOODS, INC	
Michael R. Bond	michael.bond@kutakrock.com
Erin W. Thompson	erin.thompson@kutakrock.com
Dustin R. Darst	dustin.darst@kutakrock.com
KUTAK ROCK, LLP	
Counsel for Tyson Foods, Inc., Tyson Poultry, In	c., Tyson Chicken, Inc., & Cobb-Vantress, Inc.
R. Thomas Lay	rtl@kiralaw.com
KERR, IRVINE, RHODES & ABLES	
Frank M. Evans, III	fevans@lathropgage.com
Jennifer Stockton Griffin	jgriffin@lathropgage.com
David Gregory Brown	
LATHROP & GAGE LC	
Counsel for Willow Brook Foods, Inc.	
	10 1 1
Robin S Conrad	rconrad@uschamber.com
NATIONAL CHAMBER LITIGATION CENTER	
	1.14
Gary S Chilton	gchilton@hcdattorneys.com
HOLLADAY, CHILTON AND DEGIUSTI, PLLC	Total Defense Association
Counsel for US Chamber of Commerce and Ame	Association
D. Kenyon Williams, Jr.	kwilliams@hallestill.com
Michael D. Graves	mgraves@hallestill.com
HALL, ESTILL, HARDWICK, GABLE, GOLDEN	
Counsel for Poultry Growers/Interested Parties/	
Counsel for 1 outly Growers/Interested 1 arties/	1 out y 1 at the 3, the
Richard Ford	richard.ford@crowedunlevy.com
LeAnne Burnett	leanne.burnett@crowedunlevy.com
CROWE & DUNLEVY	realine.ournettaerewedamevy.com
Counsel for Oklahoma Farm Bureau, Inc.	
Counsel for Oktanoma Farm Dureau, inc.	

Kendra Akin Jones, Assistant Attorney General	
Charles L. Moulton, Sr Assistant Attorney Gen	
Counsel for State of Arkansas and Arkansas	National Resources Commission
Mark Richard Mullins	richard.mullins@mcafeetaft.com
MCAFEE & TAFT	Tionard.mamis(e)medicetareem
	tle Feeders Association; Texas Pork Producers
Association and Texas Association of Dairyn	
	111 - 0 - 11-1
Mia Vahlberg	mvahlberg@gablelaw.com
GABLE GOTWALS	
James T. Banks	jtbanks@hhlaw.com
Adam J. Siegel	ajsiegel@hhlaw.com
HOGAN & HARTSON, LLP	
Counsel for National Chicken Council; U.S.	Poultry and Egg Association & National Turkey
<u>Federation</u>	
John D. Russell	jrussell@fellerssnider.com
FELLERS, SNIDER, BLANKENSHIP, BAILI	
& TIPPENS, PC	
& 1111 <i>B</i> 116,110	
William A. Waddell, Jr.	waddell@fec.net
David E. Choate	dchoate@fec.net
FRIDAY, ELDREDGE & CLARK, LLP	
Counsel for Arkansas Farm Bureau Federat	tion
Barry Greg Reynolds	reynolds@titushillis.com
Jessica E. Rainey	reynolds@titushillis.com jrainey@titushillis.com
Jessica E. Rainey TITUS, HILLIS, REYNOLDS, LOVE,	
Jessica E. Rainey	
Jessica E. Rainey TITUS, HILLIS, REYNOLDS, LOVE, DICKMAN & MCCALMON	jrainey@titushillis.com
Jessica E. Rainey TITUS, HILLIS, REYNOLDS, LOVE, DICKMAN & MCCALMON Nikaa Baugh Jordan	jrainey@titushillis.com njordan@lightfootlaw.com
Jessica E. Rainey TITUS, HILLIS, REYNOLDS, LOVE, DICKMAN & MCCALMON	jrainey@titushillis.com

Duane L. Berlin	dberlin@levberlin.com
LEV & BERLIN PC	
Counsel for Council of American Su	rvey Research Organizations & American Association for
Public Opinion Research	
and the same of th	

Also on this 18th day of May, 2009 I mailed a copy of the above and foregoing pleading to:

David Gregory Brown

Lathrop & Gage LC 314 E HIGH ST JEFFERSON CITY, MO 65101

Thomas C Green

Sidley Austin Brown & Wood LLP 1501 K ST NW WASHINGTON, DC 20005

Dustin McDaniel

Justin Allen

Office of the Attorney General (Little Rock) 323 Center St, Ste 200 Little Rock, AR 72201-2610

Steven B. Randall

58185 County Road 658 Kansas, Ok 74347

Cary Silverman

Victor E Schwartz

Shook Hardy & Bacon LLP (Washington DC) 600 14TH ST NW STE 800 WASHINGTON, DC 20005-2004

George R. Stubblefield

HC 66, Box 19-12 Proctor, Ok 74457

Secretary of the Environment

State of Oklahoma 3800 NORTH CLASSEN OKLAHOMA CITY, OK 73118

/s/ Richard T. Garren